

**A Preview Report for
Congressional Action on Research and Development
in the FY 1999 Budget**

This AAAS R&D Funding Update is a preview of the forthcoming publication *Congressional Action on Research and Development in the FY 1999 Budget*. (Ordering information is on the last page). This report provides estimates of **FY 1999 appropriations as signed into law** for research and development.

On October 21, three weeks into fiscal year (FY) 1999, President Clinton signed an omnibus appropriations bill (Public Law 105-277) into law, completing action on FY 1999 appropriations for the federal investment in research and development (R&D). The bill is a massive compilation of eight out of the 13 annual appropriations bills as well as supplemental and emergency appropriations and unrelated legislation. Five appropriations bills were enacted separately. Together, these FY 1999 bills provide unprecedented funding levels for federal R&D.

Every year, AAAS analyzes appropriations as signed into law and provides detailed estimates on the federal investment in R&D for new fiscal year in the publication *Congressional Action on Research and Development*. The FY 1999 edition will be released in late November. This preview report offers selected highlights from the book.

Highlights

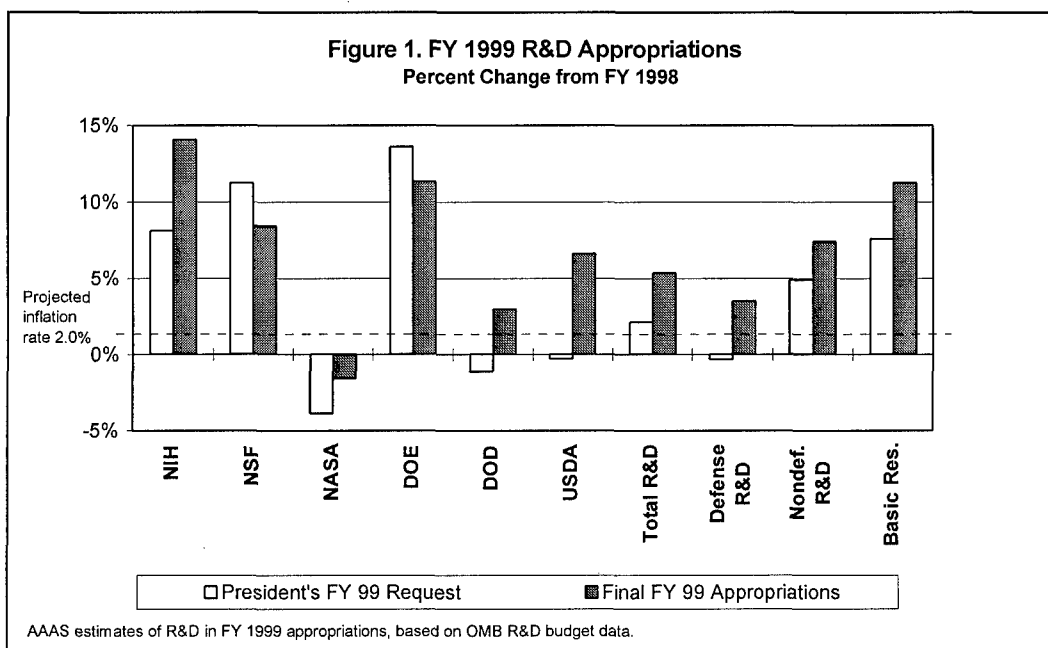
In the FY 1999 budget process, last-minute infusions of billions of dollars allowed for increases for nearly all categories of discretionary spending. FY 1999 appropriations were supposed to be limited by spending caps enacted last year which allowed for a less than one percent increase in total discretionary spending. But in the final week of negotiations, Congress and President Clinton approved billions of dollars in spending which circumvented the caps. The final agreement includes: more than \$21 billion in emergency spending for military readiness, antiterrorism, Year 2000 compliance, natural disasters, and counterdrug activities; more than \$6 billion in new budget authority shifted to FY 2000 through an accounting maneuver; \$19 billion in financing for the International Monetary Fund and UN dues¹; and \$3 billion in regular discretionary spending offset through cuts in other federal programs. Discretionary budget authority was capped in FY 1999 at \$532 billion, just 0.5 percent more than FY 1998, but final FY 1999 discretionary budget authority is expected to be \$573 billion, an increase of more than 8 percent².

¹ This funding automatically raises the caps.

² These totals do not include the previously mentioned FY 2000 advance funding. They also do not include spending from the transportation trust funds, which does not count as budget authority. Discretionary transportation trust fund spending is expected to total \$26 billion in FY 1999, an increase of 8 percent over FY 1998.

Federal support of R&D generally shared in the windfall of extra dollars, but selected high-priority areas received even greater increases, resulting in the most favorable appropriations for federal R&D in more than a decade (see Table 1):

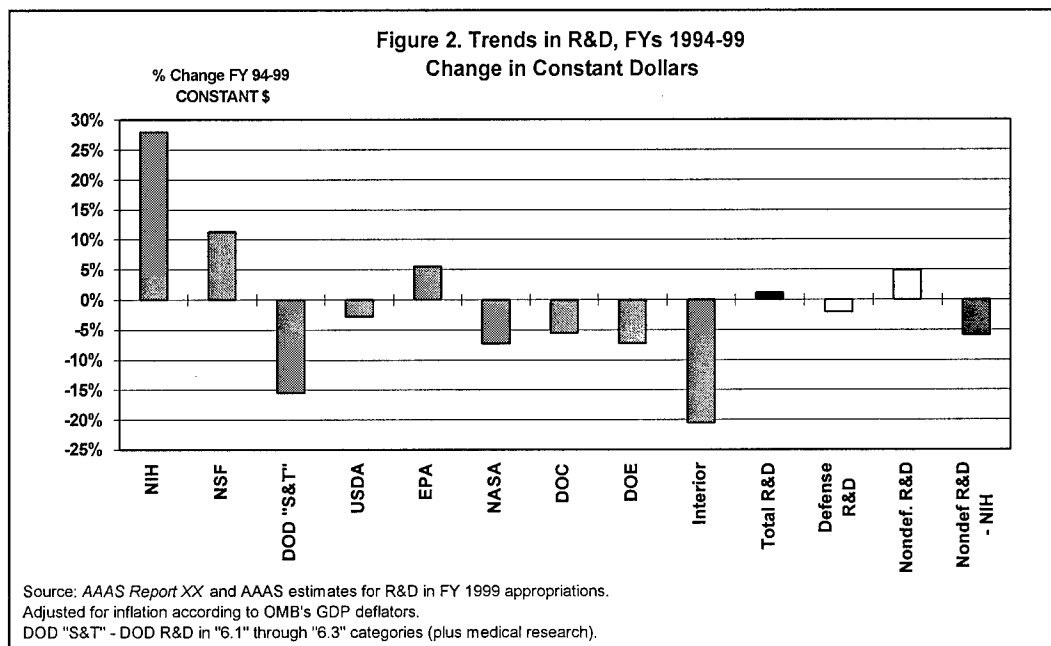
- Total federal support for R&D** in FY 1999 is expected to exceed \$80 billion for the first time in history, for a total of \$80.2 billion, \$4.1 billion or 5.3 percent more than FY 1998. Every major R&D funding agency except the National Aeronautics and Space Administration (NASA) and the Department of Commerce won increases well ahead of the expected 2.0 percent inflation rate (see Figure 1). The National Institutes of Health (NIH) received the largest dollar increase in history, a nearly \$2 billion or 14.1 percent increase in its R&D budget to \$14.9 billion. The Department of Energy (DOE) received \$7.0 billion for its R&D programs, an increase of \$714 million or 11.4 percent.
- The **FY 1999 R&D total** is \$2.4 billion or 3.1 percent above the President's request. Final FY 1999 appropriations for Department of Defense (DOD) R&D exceed the request by more than \$1.5 billion because of a last-minute, \$1 billion supplement for development of ballistic missile defenses. Appropriations also far exceed the request for NIH and U.S. Department of Agriculture (USDA) R&D. Although R&D appropriations for the National Science Foundation (NSF), DOE, and the Department of Transportation (DOT) are less than the Administration requests, these agencies nevertheless won increases above FY 1998 levels. Most other agencies received more than requested (see Figure 1).



- Basic research** is a high priority among FY 1999 appropriations. Table 2 shows that federal support for basic research is expected to total \$17.5 billion in FY

1999, an increase of \$1.8 billion or 11.3 percent. This amount is nearly \$600 million more than estimates based on the request. In dollar terms, the biggest winner again is NIH, with an estimated \$1.1 billion or 14.6 percent increase for its basic research portfolio to \$8.4 billion. NIH basic research now accounts for 48 percent of all federal support for basic research, compared to 37 percent a decade ago. Every major R&D funding agency received significant increases for basic research, including an estimated 10 percent boost for NSF basic research to \$2.4 billion. USDA basic research increases by 10.5 percent to \$658 million because of several last-minute appropriations for research. In the past four years, increases to basic research have more than kept pace with inflation. The FY 1999 funding level is 14.6 percent above the FY 1994 level after adjusting for inflation.

- Total defense R&D** for FY 1999 is \$41.8 billion, an increase of 3.5 percent, for defense programs in DOD and DOE. As Figure 1 shows, the budget request was for a slight cut. DOE's R&D in Stockpile Stewardship totals \$2.1 billion, \$290 million or 15.6 percent more than last year, including large increases for DOE's efforts in the Accelerated Strategic Computing Initiative (ASCI) and inertial confinement fusion. At the last minute, after the regular DOD appropriations bill had been signed, Congress added \$1 billion in emergency funds for the Ballistic Missile Defense Organization's (BMDO) work in theater and national missile defenses, resulting in a BMDO budget of \$4.0 billion, 23.1 percent more than FY 1998. Defense R&D represents 52.2 percent of total R&D, continuing a trend in recent years toward parity between defense and nondefense.



- The **nondefense R&D** total of \$38.3 billion for FY 1999 is \$2.7 billion or 7.4 percent more than FY 1998, far ahead of the 2.0 percent expected inflation rate. Funding for nondefense R&D in FY 1999 is 5 percent higher than the FY 1994 level in inflation-adjusted terms, after four years below that mark (see Figure 2), but this is due primarily to increases for NIH. Figure 2 shows that funding for nondefense R&D excluding NIH is still below the FY 1994 level in inflation-adjusted terms.
- The **Department of Defense (DOD)** has an R&D budget of \$38.5 billion in FY 1999, a \$1.1 billion or 2.9 percent increase over last year. This amount is \$1.5 billion more than the request. Congress awarded a 6.1 percent increase for DOD's basic research ("6.1") programs, for a total of \$1.1 billion, the first real increase in six years. Even with the increase, DOD "6.1" funding is more than 25 percent below the FY 1993 level because of several years of cuts. Applied research ("6.2") increases by \$172 million or 5.8 percent to \$3.2 billion. The \$1.0 billion supplement to BMDO development brings the organization's budget to a record \$4.0 billion. The DOD budget contains a number of congressionally designated biomedical research accounts, including \$135 million for breast cancer and \$58 million for prostate cancer.
- The **National Institutes of Health (NIH)** is once again the beneficiary of strong support for biomedical research from both branches of government. The NIH budget of \$15.6 billion represents a \$2.0 billion or 14.4 percent increase over FY 1998, putting the NIH budget on a course toward doubling in five years. NIH's R&D budget for FY 1999 is \$14.9 billion. Every institute received an increase of 10 percent or greater, and three received more than 20 percent. Because of steady increases every year, the NIH R&D budget is now 28 percent larger in inflation-adjusted terms than it was in FY 1994.
- The **National Aeronautics and Space Administration (NASA)** has an R&D budget of \$9.7 billion (down \$157 million or 1.6 percent) within a total budget of \$13.7 billion. There are significant cuts in development funding for the International Space Station (down 7.0 percent to \$2.3 billion), which remains behind schedule because of problems with its Russian-made components. There are cuts in Aeronautics and Space Transportation Technology (down 10.2 percent to \$1.3 billion), but significant increases for research-oriented programs such as Space Science (up 4.9 percent to \$2.1 billion) and Life and Microgravity Sciences and Applications (up 20.3 percent to \$264 million). As a result, NASA support of basic research is expected to increase \$134 million or 6.4 percent to \$2.2 billion.
- The **Department of Energy (DOE)** has an R&D budget of \$7.0 billion for FY 1999, \$714 million or 11.4 percent more than FY 1998. The DOE budget contains large increases for numerous programs across DOE's three missions in energy, science, and defense. In energy programs, a last-minute agreement to provide extra funds for energy research results in a Solar and Renewables R&D program of

\$332 million, 24.4 percent more than last year. Last-minute funding boosts helped to win increases for the \$301 million Fossil Energy R&D program (up 9.2 percent) and the \$386 million Energy Conservation program (up 8.4 percent). Fusion Energy Sciences remains flat at \$221 million. In the Science account, the Spallation Neutron Source (SNS) received \$107 million for first-year construction costs. As a result, Basic Energy Sciences, which funds the SNS, increases by \$131 million or 19.8 percent to \$794 million. There is a 7.9 percent boost to \$433 million for Biological and Environmental Research, which funds DOE's contribution to the Human Genome Project. In defense R&D, the Stockpile Stewardship program is funded at \$2.1 billion, \$290 million or 15.6 percent more than last year. ASCI is funded at \$306 million, an increase of 36.9 percent, while construction funding for the National Ignition Facility in California grows to \$284 million, up from \$198 million. FY 1999 is planned to be the peak year for construction.

- The **National Science Foundation (NSF)** received \$2.8 billion for its R&D in FY 1999. While this is less than the request, it is \$216 million or 8.4 percent more than FY 1998. The core Research and Related Activities (R&RA) account totals \$2.8 billion, an increase of 8.8 percent, which should allow all the R&RA directorates to receive increases of at least 7 percent. Because of significant increases the past two years, NSF's R&D is now 11.3 percent above the FY 1994 funding level in inflation-adjusted terms.
- Funding for the **Department of Commerce's** R&D programs overall declines in FY 1999, but there are increases for most Commerce programs. The National Institute of Standards and Technology (NIST) sees its R&D budget decline by \$26 million to \$467 million, due mostly to a fall in construction funding. However, NIST's intramural and extramural programs received increases: the NIST labs received \$229 million for R&D, slightly more than last year, while the extramural Advanced Technology Program received \$181 million for R&D, 6.3 percent more than last year. The National Oceanic and Atmospheric Administration's (NOAA) programs for natural resources and environment R&D increase by \$19 million or 3.3 percent to \$599 million.
- The **U.S. Department of Agriculture (USDA)** has an R&D budget of \$1.7 billion in FY 1999, an increase of \$103 million (up 6.6 percent), despite a congressional decision to block funding for a new, competitively awarded agricultural research grants program created in June. The existing National Research Initiative, which provides competitive agricultural research grants, increases \$22 million to \$119 million. At the last minute, the Agricultural Research Service (ARS) received \$23 million in emergency funding for counterdrug research, bringing total ARS R&D to \$880 million, 4.9 percent more than last year. There are sharp cuts in USDA facilities projects, allowing for substantial increases for USDA funding of research.

- The **Department of the Interior's (DOI)** R&D budget grows by 3.0 percent in FY 1999 to \$627 million. The U.S. Geological Survey received \$567 million for its R&D, \$21 million or 3.8 percent more than FY 1998 because of large increases for its biological research activities.
- The **Environmental Protection Agency (EPA)** has an FY 1999 R&D budget of \$692 million, \$20 million or 3.0 percent more than FY 1998. Congress boosted funding for particulate matter research.
- The **Department of Transportation's (DOT)** R&D budget of \$696 million (up 3.0 percent or \$20 million) is a small part of the total DOT budget. Because of a multi-year reauthorization of transportation programs in May that significantly boosted funding for highways and other surface transportation programs, the total DOT budget climbs \$4.6 billion to \$47.6 billion. The reauthorization proposes only modest gains for transportation R&D in the years ahead.
- The "Federal Science and Technology" (FS&T) budget, an alternative measure of the federal investment in science and technology developed by the National Academy of Sciences, increases by 6.5 percent in FY 1999 to reach \$48.6 billion. FS&T is a measure that encompasses total federal R&D but excludes defense advanced development, testing and evaluation programs (DOD accounts "6.4" through "6.7" and some DOE work).
- Analyzing federal investments in R&D by budget function categories, one can see significant gains in R&D, reflecting its importance to various national missions (see Table 3). Health-related R&D jumps to \$16.4 billion, up 14.0 percent, because of increases for NIH and other Department of Health and Human Services research programs. Energy-related R&D jumps 16.8 percent to \$1.4 billion because of significant, last-minute increases for DOE's energy R&D programs. General science R&D increases 8.5 percent to \$5.2 billion. There are gains for NSF and DOE programs in Basic Energy Sciences and Biological and Environmental Research, and moderate increases for DOE's High Energy and Nuclear Physics programs. Natural Resources and Environment R&D increases 3.1 percent to \$2.2 billion, the result of gains for Interior, EPA, and NOAA.

The full report offers 15 detailed funding tables, several charts, a chronology of the events in the FY 1999 budget process, an analysis of funding trends, and analyses of the impacts of the FY 1999 budget on each of the major R&D funding agencies. Individual agency analyses and funding tables are also available on the AAAS R&D Web site in the "FY 1999 R&D" section (URL at the end of this report).

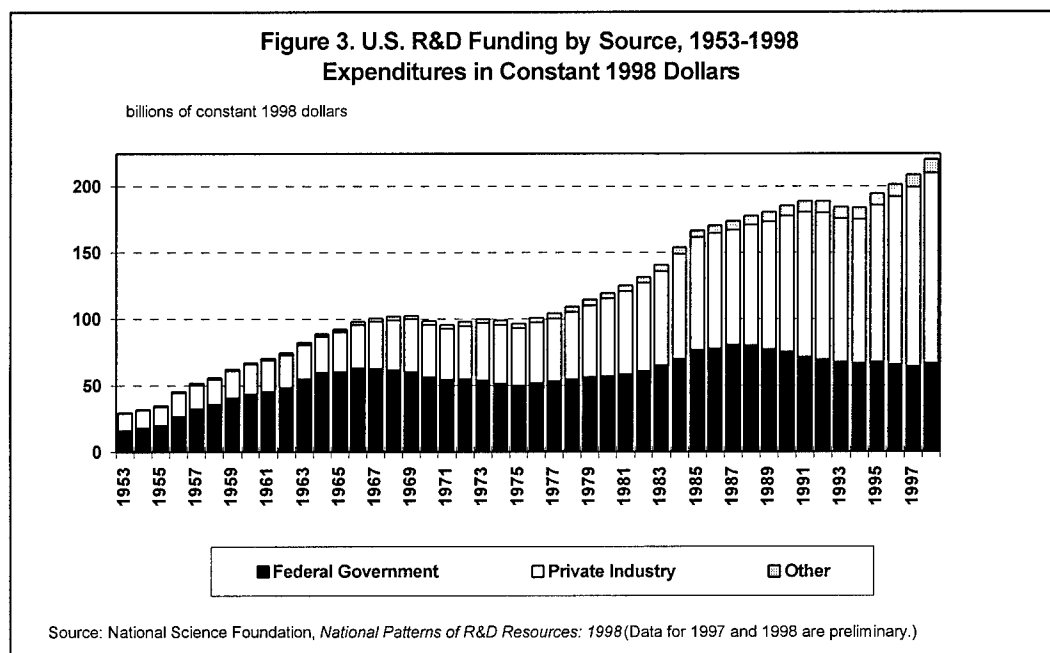
Other R&D Funding Trends

The good news for federal R&D in FY 1999 comes weeks after the close of FY 1998, when the federal government recorded a budget surplus for the first time in nearly thirty years. The final FY 1998 surplus was \$70 billion, compared to a deficit of \$23 billion the

year before (FY 1997).³ Despite a projected slowdown in the economy in the coming year and billions of dollars in additional FY 1999 spending, a surplus for FY 1999 is still likely, although it may be smaller than in FY 1998. Current budget projections show that surpluses are likely to continue for the next decade, assuming current budget policies and moderate economic growth.

As federal R&D expands, the total U.S. R&D enterprise continues to expand. Recently, the National Science Foundation (NSF) released its preliminary projections for total U.S. R&D in 1997 and 1998, including industry-funded R&D. NSF estimates that the total U.S. R&D effort in (calendar year) 1998 will be \$221 billion (see Figure 3). This represents a 7.3 percent increase over 1997, the first year that total U.S. R&D exceeded \$200 billion. Because growth in total R&D is expected to exceed growth in the U.S. economy as a whole, as measured by the Gross Domestic Product (GDP), NSF estimates that total U.S. R&D will amount to 2.61 percent of GDP, up from 2.54 percent in 1997.

Industry support for R&D is driving this strong growth rate. Industry is expected to fund \$144 billion in R&D in 1998, an increase of nearly 10 percent from 1997. As Figure 3 shows, industry has consistently expanded its share of total U.S. R&D over the past four decades, and now accounts for nearly two-thirds of total U.S. R&D.



³ These figures represent the unified surplus. The Social Security trust funds and the U.S. Postal Service are officially classified as off-budget, so there are separate on-budget and off-budget accounts. In FY 1998, there was an on-budget deficit and an off-budget surplus because of Social Security tax receipts exceeded Social Security spending by approximately \$100 billion.

⁴ The complete NSF data are available on the NSF Science Resources Studies Web site at <http://www.nsf.gov/sbe/srs/stats.htm>

Publication Information

The AAAS publication *Congressional Action on Research and Development in the FY 1999 Budget*, from which this preview report is excerpted, will be available in late November from AAAS. Ordering information is as follows:

Congressional Action on Research and Development in the FY 1999 Budget, Kei Koizumi, Albert H. Teich, Stephen D. Nelson, Joanne Padrón Carney, 1998. \$10.95; \$8.75 to AAAS members.

We are accepting advance orders for the report. Please send a check or purchase order and mailing information directly to AAAS (Science and Policy Programs, 1200 New York Ave., NW #823, Washington, DC 20005) to receive the report as soon as it is published. After publication, the report may be ordered from the AAAS Distribution Center. Address: AAAS Distribution Center, P.O. Box 521, Annapolis Junction, MD 20701. For VISA / Mastercard orders call 1-800-222-7809 (8:30 AM - 5:00 PM ET). Fax orders to 301-206-9789. For shipments to CA and DC, add applicable sales tax. For shipments to Canada, add the GST. Please allow 2-3 weeks for delivery. Please add \$4.00 for postage and handling per order. Orders must be prepaid by check or accompanied by purchase order payable to AAAS. Inquiries may be directed to AAAS (see below).

- November 3, 1998

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Table 1. Total R&D by Agency
Congressional Action on R&D in the FY 1999 Budget
(budget authority in millions of dollars)*

	FY 1998 Est.	FY 1999 Request	FY 1999 Approved	Action by Congress			
				Chg. from Request Amount	Chg. from Request Percent	Chg. from FY 1998 Amount	Chg. from FY 1998 Percent
Defense (military)	37,430	37,010	38,532	1,522	4.1%	1,102	2.9%
("S&T" 6.1, 6.2, 6.3 + Medical)	7,800	7,181	7,803	622	8.7%	3	0.0%
(All Other DOD R&D)	29,630	29,828	30,729	900	3.0%	1,099	3.7%
National Aeronautics & Space Admin.	9,884	9,504	9,727	223	2.3%	-157	-1.6%
Energy	6,288	7,142	7,002	-140	-2.0%	714	11.4%
Health and Human Services	13,809	14,888	15,748	860	5.8%	1,939	14.0%
(National Institutes of Health)	13,097	14,163	14,943	780	5.5%	1,846	14.1%
National Science Foundation	2,568	2,857	2,784	-73	-2.6%	216	8.4%
Agriculture	1,553	1,549	1,656	107	6.9%	103	6.6%
Interior	609	629	627	-2	-0.4%	19	3.0%
Transportation	676	775	696	-79	-10.1%	20	3.0%
Environmental Protection Agency	672	657	692	36	5.4%	20	3.0%
Commerce	1,081	1,083	1,076	-8	-0.7%	-5	-0.5%
(NOAA)	580	540	599	58	10.8%	19	3.3%
(NIST)	492	532	467	-65	-12.3%	-26	-5.2%
Education	209	265	231	-34	-12.7%	22	10.7%
Agency for Int'l Development	150	154	150	-4	-2.6%	0	0.0%
Department of Veterans Affairs	608	670	686	16	2.4%	78	12.9%
Nuclear Regulatory Commission	61	53	51	-2	-3.9%	-10	-16.5%
Smithsonian	146	155	151	-4	-2.7%	5	3.3%
All Other	362	343	361	18	5.2%	-1	-0.3%
Total R&D	76,106	77,734	80,170	2,435	3.1%	4,064	5.3%
Defense R&D	40,409	40,288	41,823	1,535	3.8%	1,414	3.5%
Nondefense R&D	35,697	37,446	38,347	901	2.4%	2,650	7.4%
Basic Research	15,724	16,917	17,494	577	3.4%	1,770	11.3%
"FS&T"	45,625	47,057	48,587	1,530	3.3%	2,962	6.5%

* - Authors' estimates. Includes conduct of R&D and R&D facilities.

See AAAS Report XXIII: R&D FY 1999 for details of FY 1998 estimate and FY 1999 request figures.

NASA FY 1998 figures changed from AAAS Report XXIII to reflect transfer authority granted in P.L. 105-174.

FY 1999 Approved figures are AAAS estimates of R&D funding contained in final FY 1999 appropriations bills.

Figures are adjusted to reflect rescissions, emergency appropriations, and supplementals.

All figures are rounded to the nearest million. Changes calculated from unrounded figures.

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**Table 2. Estimated Basic Research by Agency
Congressional Action on R&D in the FY 1999 Budget
(budget authority in millions of dollars)***

	FY 1998 Est.	FY 1999 Request	FY 1999 Approved	Action by Congress			
				Chg. from Request		Chg. from FY 1998	
				Amount	Percent	Amount	Percent
Health and Human Services	7,361	7,978	8,434	456	5.7%	1,073	14.6%
<i>National Institutes of Health</i>	7,360	7,976	8,432	456	5.7%	1,072	14.6%
National Science Foundation	2,165	2,442	2,381	-61	-2.5%	216	10.0%
Department of Defense	1,042	1,111	1,105	-6	-0.5%	63	6.1%
Department of Energy	2,093	2,237	2,285	48	2.1%	192	9.2%
National Aeronautics & Space Admin.	2,087	2,123	2,220	98	4.6%	134	6.4%
Department of Agriculture	595	624	658	33	5.3%	62	10.5%
Department of the Interior	58	67	68	1	2.1%	11	18.3%
Smithsonian	141	149	145	-4	-2.8%	4	2.7%
Environmental Protection Agency	60	59	65	6	9.4%	5	7.7%
Department of Commerce	34	37	36	-1	-3.4%	2	5.3%
All Other	89	89	97	8	9.5%	8	9.5%
Total Est. Basic Research	15,724	16,917	17,494	577	3.4%	1,770	11.3%

* - Authors' estimates. Includes conduct of R&D and R&D facilities.

See AAAS Report XXIII: R&D FY 1999 for details of FY 1998 estimate and FY 1999 request figures.

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**Table 3. Major Functional Categories of R&D
Congressional Action on R&D in the FY 1999 Budget
(budget authority in millions of dollars)***

	FY 1998 Est.	FY 1999 Request	FY 1999 Approved	Action by Congress			
				Chg. from Request Amount	Chg. from Request Percent	Chg. from FY 1998 Amount	Chg. from FY 1998 Percent
Defense ¹	40,409	40,288	41,823	1,535	3.8%	1,414	3.5%
Nondefense ²	35,697	37,446	38,347	901	2.4%	2,650	7.4%
Space	8,558	8,306	8,498	192	2.3%	-60	-0.7%
Health	14,392	15,536	16,407	871	5.6%	2,015	14.0%
Energy	1,168	1,496	1,364	-131	-8.8%	196	16.8%
General Science	4,796	5,302	5,205	-97	-1.8%	410	8.5%
Natural Resources & Environment	2,094	2,068	2,160	92	4.4%	66	3.1%
Agriculture	1,363	1,348	1,447	99	7.3%	84	6.2%
Transportation	2,002	1,973	1,925	-48	-2.4%	-77	-3.8%
Commerce	500	542	476	-66	-12.2%	-25	-4.9%
International	172	176	172	-4	-2.3%	0	0.0%
All Other	652	699	692	-7	-1.0%	40	6.2%
Total R&D	76,106	77,734	80,170	2,435	3.1%	4,064	5.3%

* Authors' estimates. Includes conduct of R&D and R&D facilities.

Classifications generally follow the government's budget function categories except health (which here includes health R&D in HHS and VA).

¹ Includes DOD R&D and atomic energy defense R&D in DOE.

² Includes all R&D not in defense (domestic and international discretionary programs).

See AAAS Report XXIII: R&D FY 1999 for details of FY 1998 estimate and FY 1999 request figures.

Space FY 1998 figures changed from AAAS Report XXIII to reflect NASA transfer authority granted in P.L. 105-174.

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